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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,102	11/25/2003	Cees Jan Nico Buisman	2001-1120-1	4457

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YOUNG & THOMPSON  
745 SOUTH 23RD STREET 2ND FLOOR  
ARLINGTON, VA 22202

EXAMINER

HERTZOG, ARDITH E

ART UNIT PAPER NUMBER

1754

DATE MAILED: 06/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/720,102

Applicant(s)

BUISMAN ET AL.

Examiner

Ardith E. Hertzog

Art Unit

1754

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☒ Certified copies of the priority documents have been received in Application No. 09/831,950.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date Nov 25, 2003
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Priority/Response to Amendment*

1. This application is a continuation of serial no. 09/831,950, filed May 16, 2001, now abandoned, which was filed under 35 U.S.C. § 371 based upon International Application PCT/NL99/00705, filed November 16, 1999, and published (in English) as WO 00/29605 on May 25, 2000. Acknowledgment is also made of applicant's claim for priority under 35 U.S.C. § 119(a)-(d); the certified copies have been received in the parent application. Applicant's preliminary amendment filed November 25, 2003 has been entered, and claims 1-14, as amended, are now pending.

### *Response to Declaration*

2. The declaration under 37 CFR § 1.132 filed March 17, 2004 has been carefully considered and found **sufficient** to overcome **both** 35 U.S.C. § 103(a) rejections of the claims as maintained in the parent application (i.e., that of claims 13-24 based upon WO 92/17410 in view of EP 0 819 756 A1; **and** that of claims 13-27 based upon WO 92/17410 in view of EP 0 819 756 A1, as applied to claims 13-24, and further in view of U. S. Pat. 737,579, as set forth in paper no. 6 of serial no. 09/831,950). Specifically, as the record now contains a **clear** definition/explanation of the "hydraulic residence time" (HRT) limitation of applicant's independent claim 1, it is **agreed** that this primary WO reference contains no teaching nor suggestion to utilize an HRT of "at least 5 days" as now **required** by **all** instant claims. It is noted that the only HRT given in the WO

reference is the exemplified "residence time" of 4 hours (see the WO Example on p. 6), whereas, again, all instant claims now **require** an HRT "of at least 5 days" (or 120 hours). Furthermore, as persuasively set forth in the Huisman Rule 132 Declaration, all other time periods disclosed by the WO reference are lengths of reaction (based on reaction rates), **not** HRT's, with these two process variables **not** considered equivalent in the chemical process engineering art. Note that US 5,587,079, cited on the enclosed PTO-892 (and also noted in applicant's specification), provides further evidence of this art-recognized difference: for the examples discussed in Tables 4 and 6, residence (retention) time **clearly differs from** the length of time that the reaction is run. **Similarly**, US 5,518,619 is cited on the enclosed PTO-892 for such evidence: note that the example discussed in Table H has a residence (retention) time of 5 hours versus a 60 day-long reaction run.

### ***Minor Informalities***

3. The disclosure is objected to, because of the following minor informalities:
  - a. In the first line of the specification, ", now abandoned," should be inserted after "Serial No. : 09/831,950".
  - b. There appears to be no "Brief Description of Drawings", per 37 CFR § 1.74 (see MPEP § 608.01(f)).
  - c. It is suggested that the non-standard heading "Engineering characteristics" be deleted from page 7 (see 37 CFR § 1.77(b)-(c)).
  - d. At page 8, line 15, "(4, 5 and 14)" should evidently be replaced with "(4

and 5)", given that no "gas recycle stream (14)" is shown in Figure 1.

e. In the last clause of claim 1, it is suggested that "resultant" (or some similar language) be inserted before "hydrogen sulphide", so that it is **clear** when "hydrogen sulphide" is actually formed in the claimed process for its production.

f. In claim 10, it is suggested that "gas" be inserted after "hydrogen" for consistency with the independent claim 1 (upon which claim 10 depends).

g. In claim 14, it is suggested that "and" be replaced with "or" for proper alternative language (see MPEP § 2173.05(h)I.,II.).

Appropriate correction of all the above is required.

#### ***Claim Rejections - 35 U.S.C. § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. § 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-14 are rejected under 35 U.S.C. § 112, first paragraph, because the specification, while being enabling for processes for the production of hydrogen sulphide by sulphur reduction, wherein "elemental sulphur" and "a liquid" are used as starting materials, does not reasonably provide enablement for processes for the production of hydrogen sulphide by reduction of "a sulphur **source**", wherein "**a source** of elemental sulphur" and "**a source of liquid**" are used as starting materials. It is

respectfully submitted that the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims. In particular, it is respectfully submitted that, since the "sulphur source" terminology now used in the preamble of independent claim 1 is apparently **absent** from the specification, **and** since **only specific** "elemental sulphur" and **specific** "liquid[s]" (versus **broad** "sources" thereof) appear to be discussed as starting materials in applicant's processes (see, for example, "Technical Field" statement on p. 1; 2<sup>nd</sup> sentence under "Description of the invention" on p. 2; 1<sup>st</sup> full sentence on p. 8; 2<sup>nd</sup>-3<sup>rd</sup> sentences under "*Process control*" on p. 11; last sentence on p. 11; and Examples 1-2), the specification is only enabling for, again, processes for the production of hydrogen sulphide by sulphur reduction, wherein "elemental sulphur" and "a liquid" are used as starting materials. Absent elemental sulphur **itself**, and applicant's liquid reaction medium, the specification appears to provide no guidance as to what would or would not comprise "a sulphur **source**"; "a **source of** elemental sulphur"; and/or "a **source of** liquid". It is therefore suggested that the independent claim 1 be revised as follows:

"A process for the production of hydrogen sulphide by sulphur reduction,  
which comprises:  
    providing elemental sulphur;  
    providing a liquid;  
    ..."

Appropriate clarification and/or correction is required.

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7. Claims 1-14 are **also** rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Said claims are **also** considered vague, indefinite, and/or confusing, due to the “**a source of**” language used in the independent claim 1. Specifically, the intended scope of “a source of” is not clear—especially as this language does not appear to be defined in the specification. How much “elemental sulphur” or “liquid” would need to be present in each “**source of**” such materials? It is noted that revising the independent claim 1 as suggested *supra* would **also** overcome this rejection. Appropriate clarification and/or correction is required.

8. Claim 5 is **further** rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Said claim is considered **further** vague, indefinite, and/or confusing, due to the word “also”. Specifically, this term may be interpreted as “also” indirectly modifying the hydrogen sulphide of claim 1 (upon which claim 5 depends)—meaning that the claim 1 hydrogen sulphide is “**also** stripped from the liquid medium by addition of an inert gas”. Assuming that applicant intends for only the “carbon dioxide” to be so stripped, it is suggested that “also” be deleted from claim 5. Appropriate clarification and/or correction is required.

#### ***Allowable Subject Matter***

9. Claims 1-14 would be allowable **if** rewritten or amended to overcome the rejections under 35 U.S.C. § 112, first and second paragraphs, as set forth in

paragraphs 6.-8. above.

10. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record fails to teach or to have suggested processes for the production of hydrogen sulphide by sulphur reduction comprising the **specific steps and process parameters, including the final H<sub>2</sub>S concentration levels**, as would be recited in such rewritten or amended claims. Specifically, the **prior** art of record, including that newly cited on the enclosed PTO-892, fails to teach or to have suggested the formation of gases containing **at least 1 vol.%** hydrogen sulphide, via anaerobic biological treatment, using elemental sulphur **itself** as a starting material and **an HRT of at least 5 days**. Indeed, the only art of record that discloses an HRT of as long as 5 days is WO 99/06328, which generally discloses "a mean residence time of 1 hour – 240 hours [10 days], preferably 2 - 48 hours and more preferably 2 - 36 hours, eg 5 hours" (see p. 7, lines 14-15). Yet neither this WO reference (nor its US equivalent, 6,306,302 B1) is available as **prior** art against applicant's claims, given the instant effective filing date of at least as early as December 29, 1998. Hunter et al. (US 5,922,204) has been cited herewith, since this patent discloses bioremediation methods for mixed hazardous wastes which include, among several other steps, operation of an anaerobic reactor "at a mean cell residence time of at least thirty hours" (see claims 8, 9 and 21); however, Hunter et al. provide **no teaching nor** suggestion of **a minimum HRT four times as long**—i.e., the 5 days (120 hours) now required by all instant claims.



### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. These references are considered **cumulative to or less material than** those discussed above, including those cited during prosecution of the parent application, per the enclosed PTO-1449. Note that US 5,474,682 and US 6,217,766 B1 have been cited on the enclosed PTO-892, since respective equivalents of WO 92/17410 and EP 0 819 756 A1 applied in serial no. 09/831,950. All other references on the PTO-892, including the "Society for Mining, Metallurgy, and Exploration, Inc." preprint (presented March 9-11, 1998), are considered **less material than** those discussed *supra*. They have been cited as merely of interest, since, although drawn to various (waste)water treatment methods via anaerobic bacterial sulfur reduction and/or precipitation of heavy metals, none teach the use of elemental sulfur **itself** as starting material, nor HRT's **of the same order of magnitude**, as now **required by all** instant claims.

12. Any inquiry concerning this communication should be directed to Ardith E. Hertzog at telephone number (571) 272-1347. The examiner can normally be reached on Monday through Friday (from about 8:00 a.m. - 4:30 p.m.).

13. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley S. Silverman, can be reached at (571) 272-1358. The fax phone number for the organization where this application is assigned is 703-872-9306.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

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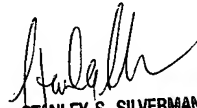
published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. For any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



AEH  
May 28, 2004



**STANLEY S. SILVERMAN**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 1700**